



MODEL ENERGY CLUSTER – SPECIAL ENERGY ZONE DELIVERING INTEGRATED TERRITORIAL ENERGY

Joanna Gronkowska

Summary

Clusters constitute an organizational and economic phenomenon. Today, they are created in nearly all sectors of the economy, including production industry, services, and high technology industries. Act of 20 February 2015 on Renewable Energy Sources (RES Act, 2015) introduced the term “energy cluster”. In the present article, we attempt to answer the question of how the energy cluster can pursue, on a local level, the goal of ensuring energy security, while respecting the requirements of environmental sustainability.

Keywords

energy cluster • special energy zone • integrated territorial energy policy • public services • smart grid • local self-government units

1. Conditions for the functioning of energy clusters in the light of current legislation

The overriding aim of the State energy policy, in line with the provisions of Article 3 points 13 and 16 of the Energy Law, is to ensure energy security of the country. This means such economic governance that makes it possible to cover the current and prospective needs of consumers for fuel and energy in a technically and economically justified way, while maintaining the environmental protection requirements [Ustawa 2017]. At the same time, Article 15 passage 1 of the Energy Law requires that the State’s energy policy be developed in accordance with the principle of sustainable development of the country, as defined in Article 5 of the Constitution [Konstytucja 1997] as well as Article 30 point 50 of the environmental protection law [Ustawa 2016]. The regulation refers to the achievement of natural balance and the sustainability of basic natural processes in order to guarantee the ability to meet the basic needs of individual communities or citizens. Achieving this status in practice is extremely difficult [Szyrski 2017, p. 20]. As stated in Article 8 of the Environmental Protection Directive, this also has direct implications for the development of the energy sector, through the provision that policies, strategies, plans or programs related specifically to industry, energy, trans-

port, telecommunications, water management, waste management, spatial planning, forestry, agriculture, fisheries, tourism and land exploitation should take into account the principles of environmental protection and sustainable development [Ustawa 2016].

Closely linked with the implementation of energy policy is the implementation of the Act on Renewable Energy Sources [Ustawa 2015], in order to increase energy security and environmental protection, as a result of, *inter alia*, the efficient use of renewable energy sources [Ustawa 2014]. The concept of “energy cluster” was introduced in the aforementioned law as (quoting from the Act):

“a civil law agreement, which could include natural persons, legal persons, scientific units, research institutes or local government units, and which concerns the generation and balancing of demand, distribution or turnover of energy from renewable sources or from other sources or fuels, within a distribution network with a rated voltage of less than 110 kV, within the area of operation of that cluster not exceeding the limits of one county (*powiat*) within the meaning of the Act of 5 June 1998 [Ustawa 1998] on the county-level self-government (Dz. U. 2016, poz. 814) or 5 municipalities (*gminy*) within the meaning of the Act of 8 March 1990 on municipal self-government (Dz. U. 2016, poz. 466); whereas the energy cluster is represented by a coordinator, a co-operative, an association, a foundation, or a civil society group, designated by the civil-law agreement, hereinafter referred to as ‘energy cluster coordinator.’”

In the RES law itself, the concept of energy cluster appears only in Article 2 passage 15a, Article 38a, and Article 73 passage 3a point 4, whereas there is no mention of the tools available to the energy cluster that would enable it to pursue its energy policy objectives. When attempting to find suitable tools, a desk research method was used, based on the study of source documentation and information contained in foreign and Polish scientific publications.

According to M. Szyrski, the RES zone equals not only the provisions of the Energy Law or the Act on Renewable Energy. Substantial conditions are also relevant under the provisions of other legislative Acts, including Construction Law, Land Planning and Zoning Law, Environmental Law, Nature Conservation Law, Marine Areas Regulations, Environmental Information and Protection Law, Public Participation in Environmental Protection and Environmental Impact Assessment, as well as Amendments to certain acts of law, pertaining to the strengthening of landscape protection tools. Taking into account the multitude of tasks and legal provisions that regulate the issue of renewable energy sources, one can conclude that the following are currently missing:

- coherence of objectives – in the sense that objectives of planning acts (for instance, long-term strategy of the country) do not coincide with the objectives of legislative acts;
- institutional cohesion – in the sense that the most important tasks are performed by the state administration, because the regulations do not provide for tasks on the part of local government and therefore a certain “blurring” of responsibility for policy implementation occurs;
- legislative consistency of the legal system.

In the case of analysis of the RES domain, we are facing the pressing need to combine these systems in the process of interpretation of regulations [Szyrski 2017, p. 17–18, 72–73; Leszczyński 2015, p. 25].

Currently emerging, and beginning to play an important role in the strategic documents, is the idea of scattered power industry (distributed energy) and the so-called ‘smart grid’ – as a power system that combines the economically efficient, safe and reliable operation of all participants in the power market, both in terms of energy generation, transmission and distribution, as well as power consumption. This idea is of high importance to the achievement of the basic goals of climate and energy policies [Polityka energetyczna 2009; Projekt polityki energetycznej; Elżanowski 2010, p. 18; Szyrski 2017, p. 11, 83; Ministerstwo Gospodarki 2014, p. 32]. The concept covers a very broad range of small-scale power technologies for the production of electricity, heat and liquid fuels in a decentralized manner, and for their local use. This includes energy sources that cooperate with the distribution network (up to 110 kV) or directly feed the recipient [Dziamski, Kamińska, Michałowska-Knap and Wiśniewski 2011, p. 5; Szyrski 2017, p. 82]. Furthermore, it is claimed that the far-reaching deregulation and simplification of the connection of micro-installations to distribution networks is expected to increase consumers’ interest in selling surplus homemade electricity [Projekt polityki energetycznej]. Therefore, herein is a direct reference to the statutory conditions of the energy cluster.

Power generation that is scattered due to the diversification of energy sources should be considered first and foremost in terms of the activity of local communities, including those undertaken with the support of local self-government units, which at local level act as initiators, planners, investors, producers and end users [Węglarz et al. 2015, p. 5; Sobieraj 2014, p. 292].

The legislators decided that issues related to energy should be the municipality’s own task, including the supply of electricity, heat and gas, planning and organization of heat supply, electricity and gas fuel, planning and financing of public lighting, public roads, plazas, and other public spaces, planning and organization of energy efficiency measures and promotion of solutions that reduce energy consumption as well as assessment of the potential for electricity production in high-efficiency co-generation, and energy-efficient heating or cooling systems. The legislative bodies are also working on developing the premises for a 15-year power supply plan pertaining to heat, electricity and gaseous fuels [Ustawa 1990]. In turn, the county (*powiat*) performs public tasks of a supra-municipal character, including, among other things, protection of the environment and nature [Ustawa 1998]; whereas the newly introduced law on metropolitan union in the Silesia Region does not even envisage the implementation of a common energy policy [Ustawa o związku metropolitalnym 2017].

As follows from the analysis of various provisions of the Acts, it can be concluded that the legislators have assigned the RES-related tasks only to government entities and agencies (Minister competent for energy, Government Plenipotentiary for Strategic Energy Infrastructure, Minister competent for rural affairs, President of Agricultural Market Agency (Agencja Rynku Rolnego), Minister competent for the environment,

the President of GUS – Statistical authority) and the regulating entity – the latter also dependent on the State government administration to a significant degree [Swora 2010, p. 966].

Thus, no law sufficiently provides for the role of local self-government in the development of scattered power industry (distributed energy). The Act on renewable energy sources gives some privileges to household power producers, but there are no preferential regulations for local self-governments; at the same time, participation in energy companies [Pawelczyk 2001] or possession of energy infrastructure elements is not yet widespread [Szyrski 2017, p. 13]. There is a lack of performance standards and fiscal regulations. Tasks have been reduced, in fact, to the mere planning of energy security. Such a normative-legal situation can raise serious doubts concerning the implementation of the constitutional principle of subsidiarity and the decentralization of public administration [Szyrski 2017, pp. 85, 100, 152].

According to Article 16 passage 2 of the Constitution, local self-government participates in the exercise of public authority and is obliged to perform a substantial part of public tasks on its own behalf and at its own responsibility [Konstytucja RP 1997]. Nowadays, “local government” (local elected self-government) must be understood primarily as the right and effective capacity of local communities, within the limits of the law, to direct and manage an essential part of public affairs in the interests of the citizens, in accordance with the principle of subsidiarity [Jagoda 2011, p. 34], by which principle, the larger and higher level groups should perform only those tasks that the groups at a lower level cannot handle [Springer 1996, p. 25; Srokosz 2016, p. 21]. Since the legislators envisaged the area of energy cluster activity within the boundaries of one county, it seems natural that it should be the county, as a unit of local self-government, that assumes – as a public task – the role of organizing and supporting the realization of the distributed energy idea.

The performance of public tasks is not an optional activity dependent on the will of the public administration, “since it constitutes a legal obligation attributed to the subject by acts of law” [Tabernacka 2005, p. 417]. This is carried out through tasks in the field of law enforcement and regulatory administration and the provision of public services. The latter, regardless of their type, constitute a process that consists of at least four elements – beginning with the organization of the public service system, to its financing, the direct provision to citizens, and the control of implementation [Sześciło 2014, p. 25–26].

Referring to the work commissioned by the Sejm [Polish Parliament] Analysis Bureau [Grycuk and Russel 2014, p. 66], “local self-government units have at their disposal a wide range of instruments to support entrepreneurship development in their area.” Because of the nature of the impact, these instruments can be divided into: financial, infrastructural, legal, administrative, planning, information and marketing-related, as well as institutional [Markowska-Bzducha 2013]. The latter group includes entrepreneurship-supporting institutions, in the appointment of which the local self-government may participate [Krajewski 2013, p. 141]. These may include: credit guarantee funds, loan funds, entrepreneurship support centres, entrepreneurship incubators, information

centres, investor service centres, local development agencies, technology parks, industrial parks, special economic zones (SEZs), clusters, local economic councils, or trade fairs [Grycuk and Russel 2014, p. 67–71]. Among all those listed, the Special Economic Zone (SEZ) is a particular type, which forms part of the dedicated administrative area where economic activity can be conducted on preferential terms. The main advantage for entrepreneurs is the possibility of obtaining public assistance, among others, in the form of tax exemptions or tax breaks. In the literature on the subject, the following types of SEZs may be encountered SEZ World Bank [Susmarski 2014, p. 270]:

- duty free zones, primarily free tax zones, oriented towards warehousing, storage, distribution and transshipment services;
- free trade zones – industry oriented areas for servicing foreign markets;
- entrepreneurship zones, which aim to revitalize the designated areas through a system of grants, tax breaks and other incentives;
- freeports – larger areas where various kinds of activity take place (free zones, industrial zones, tourist zones, free trade zones), offering a much wider range of investment incentives;
- single-enterprise-oriented zones offering incentives to individual businesses, regardless of their location;
- specialized zones, containing technology parks, scientific parks, petrochemical zones, logistics zones, and others.

According to the provisions of the SEZ Act, the main purpose of the establishment of a zone of this kind is to accelerate the economic development of a given part of the country's territory, by developing, *inter alia*, specific economic areas or sectors, as well as fostering new technical and technological solutions and the application thereof. The SEZ administrator's tasks include, in particular, undertaking activities aimed at creating clusters [Ustawa 1994]. At the same time, local self-government units may be shareholders in the zones and they may support the creation of SEZ sub-zones in their area. They may also support or participate in cluster initiatives, which are a geographical cluster of enterprises belonging to the same or related sectors, suppliers and related institutions cooperating with each other [Grycuk and Russel 2014, p. 70].

It seems that SSE is a relatively effective form of assistance. The analysis of the available data [Ministerstwo Rozwoju 2016] shows, for investments completed in such zones by the end of 2014, with the total value of PLN 101.9bn, that lost budget revenues (income tax exemptions of investors and managers of SEZs) amounted to PLN 17.2bn. It can therefore be estimated that the effective level of support for enterprises in the SEZ amounted to about 17% of the value of investment expenditures, which means that each PLN 1 in tax exemption generated an income of PLN 6, invested by the investors in the SEZ.

As follows from the analyses that were carried out, also another solution – similar to the SEZ – and taking the form of organized municipal business zones may produce increased revenues to the public budget, by using the mechanism of increasing taxa-

tion areas with a simultaneous lowering of top-tier real estate tax rates [Marczak 2014, p. 289].

Equally interesting are the Integrated Territorial Investment (ITI) projects, which should be applied where urban development strategies or other territorial strategies or pacts require an integrated approach, involving investment in more than one priority axis, or one or more operational programs. In addition, they should be able to delegate specific tasks related to the implementation of part of the program to the sub-regional or local level [Szołek 2015, p. 191]. The chief goals of the ITIs include promoting a partnership model of cooperation, and the implementation of integrated projects responding comprehensively to the needs and problems of cities and their functional areas. The tasks supported within the framework of the ITIs, will include projects in the field of environmental improvement in the functional area of the city, projects supporting energy efficiency, and projects aimed at the promotion of low carbon strategies (ZIT, 2017).

2. Proposed legal and organisational framework for energy clusters

In light of the problems outlined and the absence of their statutory solutions, while taking into account examples of various institutional options, four proposals have been formulated for elementary actions, which comprise a holistic process that enables the poviats (counties) to carry out its own energy security tasks, and to promote renewable energies. These proposed actions are as follows:

1. **Developing scattered power industry (distributed energy) from renewable sources**
 - a) Achieving the alignment and unambiguity of legal provisions, the unambiguity of the case law and the doctrine of legal regulation concerning renewable energy sources, in connection with EU regulations, including: energy law; in the following Acts of Law pertaining to: energy efficiency; renewable energy sources; spatial planning and zoning; environmental protection; protection of nature; marine areas; information on the environment and its protection, public participation in the environmental protection and environmental impact assessments, as well as the amendments to certain Acts in connection with the strengthening of landscape protection tools; investing in wind power plants; building regulations.
 - b) The Government Administration Act establishes a vertical normative system, resulting in the present limitation to only one department of public administration. There is no wider perception in the network and multilevel view [Caban and Wiśniewska-Chruściel 2009, p. 67]. This is particularly evident in the sphere of energy, where there are too few horizontal initiatives, for instance, between various entities on the same level of administration (cooperation and coordination) [Cieślak 2004, p. 63]. In this case, it is not just about a joint legislative initiative and mutual consultation; instead, it is about the widest possible collaborative design and development of legal frameworks [Szyrski 2017, p. 162] and the instruments of action that would enable the creation of energy companies.

- c) The Act on Renewable Energy Sources should include regulations concerning the association of territorial self-government entities in the implementation of the distributed energy idea, with reference to existing legal forms in local self-government legislation [Szyrski 2017, p. 154].
- d) The provisions of the Law on municipal economy provide for a rigid framework as to the form of creating municipal economy entities, in which energy activities may be carried out [Gonet 2009, p. 72]. As a result of the emergence of new technologies, and with them, new forms of supporting these technologies, this regulation may seem archaic. In fact, the cooperation of local self-government units and also hybrid forms should play a fundamental role [Szyrski 2017, p. 155].

2. Financing the tasks pertaining to scattered power industry – distributed energy from renewable sources

- a) Creation of provisions that would introduce and implement the idea of distributed energy in territorial self-government as well as – in particular – the preparation and implementation of RES investment projects. As an example, we might quote the provisions of the Act on the Implementation of Investment in Nuclear Power Plants and Accompanying Investment and the Act on Special Rules for the Preparation and Implementation of Investment in Public Roads [Ustawa 2011; Ustawa 2003; Sześciło 2014, p. 154].
- b) Creation of provisions in the Local Charges and Tax Act [Ustawa 1991], concerning financial incentives for the implementation of distributed energy idea, for instance, in terms of the transfer of revenues from the generation of renewable energy to local self-government [Szyrski 2017, p. 155].
- c) Establishing a support system in the form of guaranteed feed-in tariffs [Analiza 2014, p. 15–16; Jankowska 2014; Krassowski and Świerkula 2015, p. 12–13; Bohdan and Przybylska 2015, p. 38–55; Spasowska-Czarny 2016, p. 91, 95].
- d) Establishing a support system in the form of net metering (Cres-energy.org 2013; Tiglao 2015; Myers 2016).
- e) Creation (on the part of the State) of instruments supporting the production of energy from renewable sources such as, *inter alia*, investment subsidies, fixed-premium systems, tax credits, a tendering system, tradable green certificate system [Brodawka, 2016, p. 57–63; Przybylska-Cząstkiewicz 2016, p. 67–76; Muras 2012, p. 344; Soliński 2008, p. 110–112).

3. Provision of public services in the field of distributed energy from renewable energy sources

It would be expedient to apply a hybrid solution, through the creation of a Special Energy Zone that implements Integrated Territorial Energy policy, which:

- occurs in the area of energy cluster's operation, within the boundaries of one poviát (county) as a zone specialising in distributed energy;
- offers a wide range of investment incentives, for instance targeted or entity-centred grants for the implementation of investment projects by the managing company;

- offers a wide range of tariff incentives (including feed-in, net metering) as well as support for the RES energy production;
 - is managed by a coordinator, which may be a not-for-profit partnership or a not-for-profit limited company [Walaszek-Pyziół 2017], in which a local (poviat-level) self-government or a group of local self-government units holds the majority of votes;
 - owns RES facilities, which are the property of the managing company;
 - holds a concession and a tariff for the production of RES energy, issued by the URE of the managing company.
4. **Establishing and controlling distributed energy from renewable energy sources**
- a) The Council of Ministers, at the request of the minister responsible for energy, shall establish a Special Energy Zone by means of a regulation (a decree).
 - b) The President of the Energy Regulatory Office regulates the activity of the manager of the Special Zone, in accordance with the Energy Law and the state energy policy.

3. Conclusions

In light of the above-mentioned legal and organizational proposals, the Special Energy Zone implementing the Integrated Territorial Energy policy seems to be the solution that guarantees the possibility of planning the distributed RES energy (scattered power industry) in the long run. As such, it would be an extended and comprehensive tool, serving to integrate strategic, financial and operational activities at the level of functional and spatial structures of poviats (counties). It would also provide the opportunity to comprehensively implement RES infrastructural investment projects, with the simultaneous fulfilment of the overarching goal of energy security, while maintaining the environmental sustainability requirements. All these items have been summarized in Table 1.

Table 1. Special Energy Zone implementing the Integrated Territorial Energy policy

Overall objective	Priority	Activities
Ensuring energy security, while respecting the requirements of environmental protection in accordance with the principle of sustainable development.	Achieving the efficient use of RES by developing local distributed energy	Developing scattered power industry – distributed energy from renewable sources in the Special Energy Zone
		Financing the tasks pertaining to scattered power industry – distributed energy from renewable sources in the Special Energy Zone
		Provision of public services in the field of distributed energy in terms of power generation and balancing of demand, distribution or trading of energy from renewable energy sources or other sources or fuels in the Special Economic Zone

Source: author's study

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Mgr Joanna Gronkowska
Skarbnik Powiatu Tatrzańskiego
34-500 Zakopane, ul. Chramcówki 15
e-mail: gronkowska.joanna@gmail.com